

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. Vithale Deshpande, Environmental Coordinator
City Hall
93 Highland Avenue
Somerville, MA 02143

Dear Mr. Vithale Deshpande,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone".

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Capuano School
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
Properties on Palmer Avenue (Map104/Block A/Lot26), Gill Court (Map 104/Block A/Lot 28), and Franklin
a. Street Address: Street (Map 104/Block A/Lots 34,35, and 36)
- b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- ☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
- ☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil _____
- ☒ 2. Groundwater see attached
- ☐ 3. Surface Water _____
- ☐ 4. Sediment _____
- ☐ 5. Indoor Air _____
- ☐ 6. Other: _____
(specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
- ☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

STN 1-2204

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:
Laidlaw Corporation
68 Joseph Road
Wilmington, MA 01897

Prepared by:
GEI Consultants, Inc.
400 Union Park Drive
Woburn, MA 01801
Tel: 781-933-4000

July 14, 2009
Project No. 04516-3

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

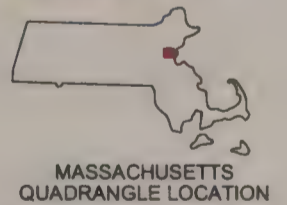
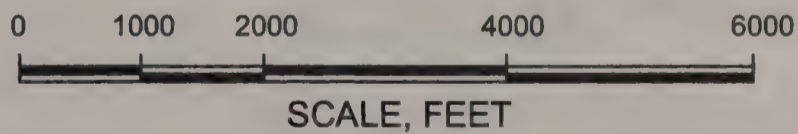
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

LETTER OF TRANSMITTAL

400 Unicorn Park Drive
Woburn, MA 01801
Phone: (781) 721-4000 Fax: (781) 721-4073
www.geiconsultants.com

To:	Rhoda Augarten	Date:	May 27, 2009
	Somerville Public Library	Project No:	04516-3
	79 Broadway	Re:	50 Tufts Street
	Somerville, MA 02145		Somerville, Massachusetts
			RTN 3-23246

We are sending you the following enclosures:

Quantity	Date	Description
1	5/20/09	Copy of Informational Notice of Property Owners Letters, 50 Tufts Street.

These are transmitted as checked below:

☐ For Approval ☒ For Your Use ☐ For Review/Comment ☐ As Requested ☐ Other

Message:

Copy to:

Signed: Ileen Gladstone

If enclosures are not as noted, kindly notify us at once.

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Margaret Murray
5 Washington Avenue
Somerville, MA 02143

Dear Ms. Margaret Murray,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Margaret Murray
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
- a. Street Address: Properties on Washington Avenue (Map 104/Block D/Lot 70 & 71)
- b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- ☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
- ☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil _____
- ☒ 2. Groundwater see attached
- ☐ 3. Surface Water _____
- ☐ 4. Sediment _____
- ☐ 5. Indoor Air _____
- ☐ 6. Other: _____
(specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
- ☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

**Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts**

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

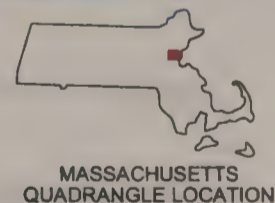
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

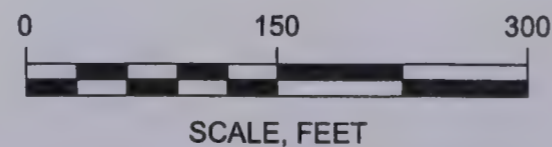


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Frances Trenholm
7 Reed Court
Somerville, MA 02143

Dear Frances Trenholm,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Frances Trenholm
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 7 Reed Court
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

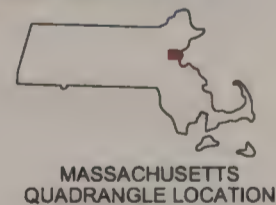
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

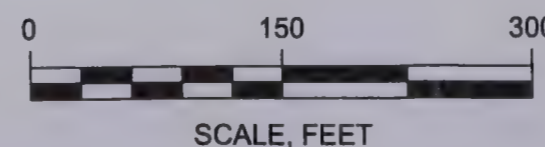


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. & Mrs. Steven and Dawn Tarza and Mr. Henry Klerowski
6 Reed Court
Somerville, MA 02143

Dear Mr. & Mrs. Steven and Dawn Tarza and Mr. Henry Klerowski,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Steven and Dawn Tarza and Henry Klerowski
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 6 Reed Court
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :

(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

**Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts**

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

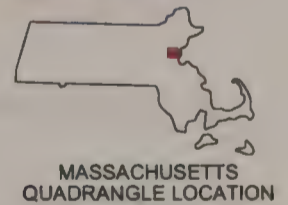
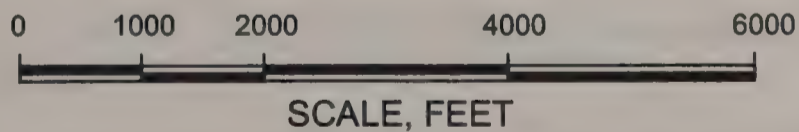
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

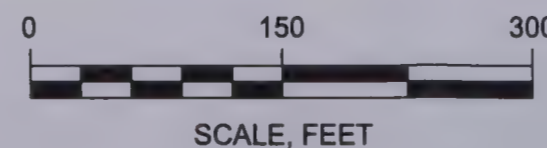


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. & Mrs. Francisco and Dorothy Pacheco
22 Oliver Street
Somerville, MA 02143

Dear Mr. & Mrs. Francisco and Dorothy Pacheco,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Francisco and Dorothy Pacheco
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 20-22 Oliver Street
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- | | |
|---|---------------------|
| <input type="checkbox"/> 1. Soil | _____ |
| <input checked="" type="checkbox"/> 2. Groundwater | <u>see attached</u> |
| <input type="checkbox"/> 3. Surface Water | _____ |
| <input type="checkbox"/> 4. Sediment | _____ |
| <input type="checkbox"/> 5. Indoor Air | _____ |
| <input type="checkbox"/> 6. Other: _____
(specify) | _____ |

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

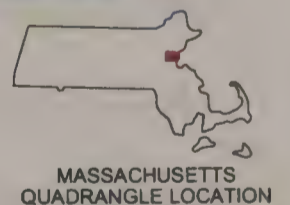
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Vaishali Jalan
140 Hunolt Street, #6
Santa Cruz, CA 95060

Dear Ms. Vaishali Jalan,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Vaishali Jalan
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 71 Knowlton Street
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :

(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

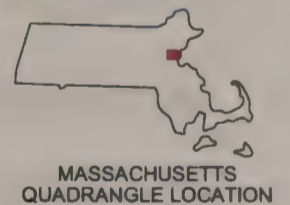
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

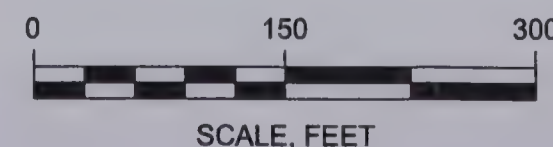


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Polly Sutton Stevens
69 Knowlton Street
Somerville, MA 02143

Dear Ms. Polly Sutton Stevens,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Polly Sutton Stevens
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 69 Knowlton Street
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

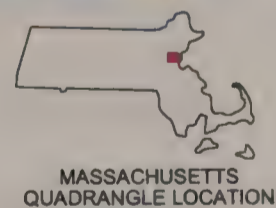
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



SITE LOCATION MAP

Project 04516-2

July 2008

Fig. ES-1

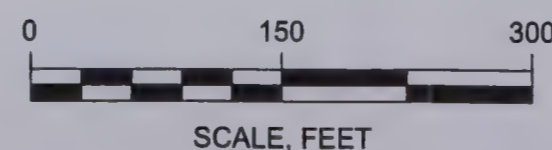


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

May 2009

DISPOSAL SITE MAP
AND
SITE BOUNDARY

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Cruz and Candida Roman
67 Knowlton Street
Somerville, MA 02143

Dear Cruz and Candida Roman,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone". The signature is fluid and cursive, with a large loop at the end.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Cruz and Candida Roman
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 67 Knowlton Street
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

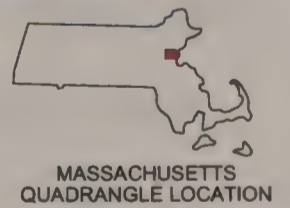
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

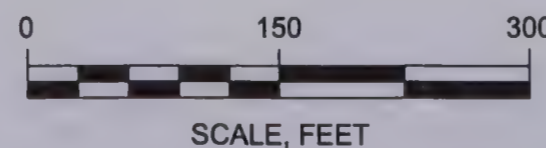


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Terezinha Santos and Gibberto Queiroga
116 Jefferson Avenue
Everett, MA 02149

Dear Terezinha Santos and Gibberto Queiroga,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street

2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Terezinha Santos and Gibberto Queiroga

2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:

a. Street Address: 66-66a Franklin Street (& Franklin Street property Map104/Block E/Lot 10)

b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- | | |
|---|--------------|
| <input type="checkbox"/> 1. Soil | _____ |
| <input checked="" type="checkbox"/> 2. Groundwater | see attached |
| <input type="checkbox"/> 3. Surface Water | _____ |
| <input type="checkbox"/> 4. Sediment | _____ |
| <input type="checkbox"/> 5. Indoor Air | _____ |
| <input type="checkbox"/> 6. Other: _____
(specify) | _____ |

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

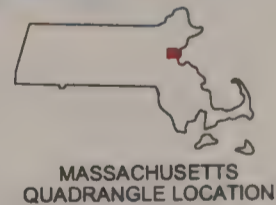
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- STREET ADDRESS

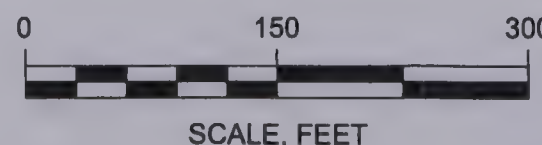
MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)

µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



DISPOSAL SITE MAP
AND
SITE BOUNDARY

Project 04516-3

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. & Mrs. Gilberto and Rosa Pontes
65 Franklin Street
Somerville, MA 02143

Dear Mr. & Mrs. Gilberto and Rosa Pontes,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Gilberto and Rosa Pontes
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 65 Franklin Street
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- | | |
|--|---------------------|
| <input type="checkbox"/> 1. Soil | _____ |
| <input checked="" type="checkbox"/> 2. Groundwater | <u>see attached</u> |
| <input type="checkbox"/> 3. Surface Water | _____ |
| <input type="checkbox"/> 4. Sediment | _____ |
| <input type="checkbox"/> 5. Indoor Air | _____ |
| <input type="checkbox"/> 6. Other: _____ | _____ |
| (specify) | |

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW120D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

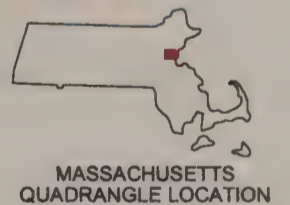
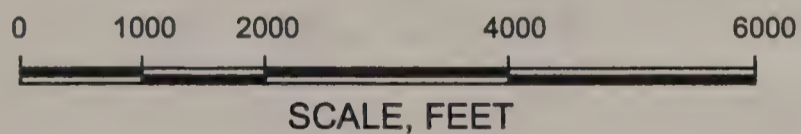
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS

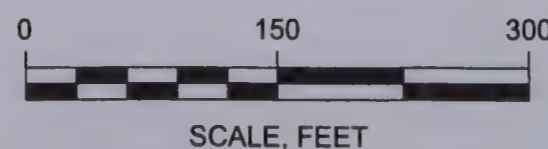
MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)

µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



DISPOSAL SITE MAP
AND
SITE BOUNDARY

Project 04516-3

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. Silverio Pereira
34 Franklin Avenue
Somerville, MA 02143

Dear Mr. Silverio Pereira,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Silverio Pereira
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
- a. Street Address: 38 Franklin Avenue
- b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- ☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
- ☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- | | |
|--|---------------------|
| <input type="checkbox"/> 1. Soil | _____ |
| <input checked="" type="checkbox"/> 2. Groundwater | <u>see attached</u> |
| <input type="checkbox"/> 3. Surface Water | _____ |
| <input type="checkbox"/> 4. Sediment | _____ |
| <input type="checkbox"/> 5. Indoor Air | _____ |
| <input type="checkbox"/> 6. Other: _____ | _____ |
| (specify) | |

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
- ☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

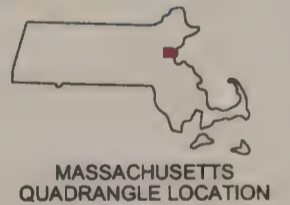
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

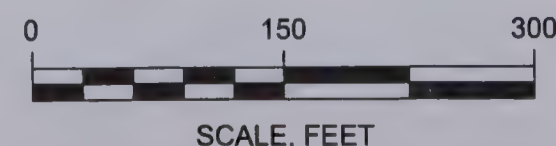


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. & Mrs. Silverio and Maria Pereira
34 Franklin Avenue
Somerville, MA 02143

Dear Mr. & Mrs. Silverio and Maria Pereira,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Silverio and Maria Pereira
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 34 Franklin Avenue
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

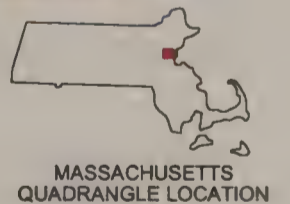
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



SITE LOCATION MAP

Project 04516-2

July 2008

Fig. ES-1

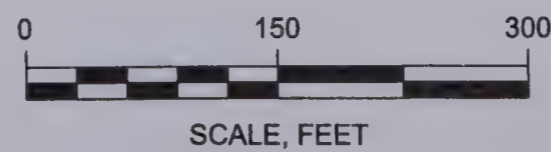


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Marcia Carnezi
34 Franklin Avenue, #2
Somerville, MA 02143

Dear Ms. Marcia Carnezi,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Marcia Carnezi
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 32 Franklin Avenue (& Franklin Ave property Map 104/Block E/Lot 15A)
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

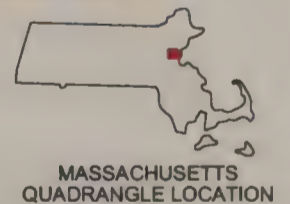
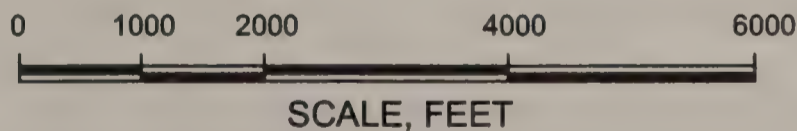
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



SITE LOCATION MAP

Project 04516-2

July 2008

Fig. ES-1



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- STREET ADDRESS

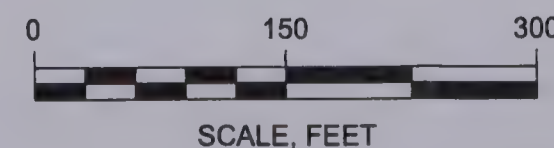
MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)

µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Machado Nilda
31 Franklin Avenue
Somerville, MA 02143

Dear Machado Nilda,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone". The signature is fluid and cursive, with a large loop at the end.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Machado Nilda
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 31 Franklin Avenue
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

May 2009

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

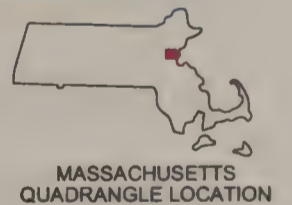
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

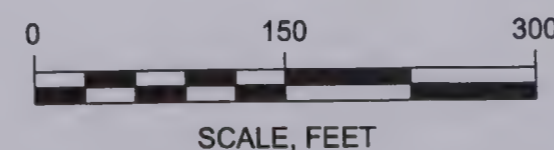


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. John Crowell
29 Franklin Avenue
Somerville, MA 02143

Dear Mr. John Crowell,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: John Crowell
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 29 Franklin Avenue
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

May 2009

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicom Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

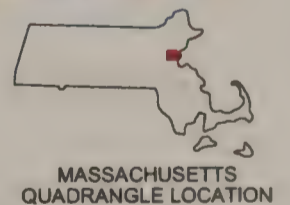
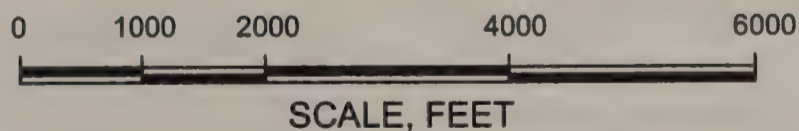
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



SITE LOCATION MAP

Project 04516-2

July 2008

Fig. ES-1

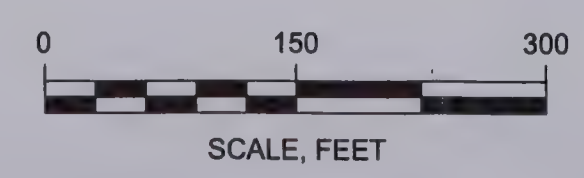


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street Somerville, Massachusetts			DISPOSAL SITE MAP AND SITE BOUNDARY	
UniFirst Corporation Wilmington, Massachusetts			Project 04516-3	May 2009

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Rinku and Bikas Pradhan
27 Franklin Avenue
Somerville, MA 02143

Dear Rinku and Bikas Pradhan,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Rinku and Bikas Pradhan
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 27 Franklin Avenue
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :

(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- | | |
|--|---------------------|
| <input type="checkbox"/> 1. Soil | _____ |
| <input checked="" type="checkbox"/> 2. Groundwater | <u>see attached</u> |
| <input type="checkbox"/> 3. Surface Water | _____ |
| <input type="checkbox"/> 4. Sediment | _____ |
| <input type="checkbox"/> 5. Indoor Air | _____ |
| <input type="checkbox"/> 6. Other: _____ | _____ |
| (specify) | |

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

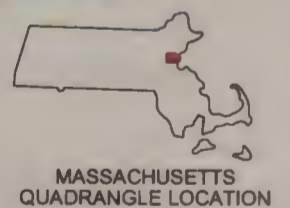
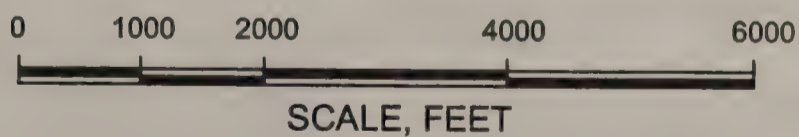
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).

0 150 300
SCALE, FEET

50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Mr. David Castro and Ms. Roxana Huezo
26 Franklin Avenue
Somerville, MA 02143

Dear Mr. David Castro and Ms. Roxana Huezo,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: David Castro and Roxana Huevoz
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 26 Franklin Avenue (& Franklin Ave property (Map 104/Block E/Lot 15)
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicom Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

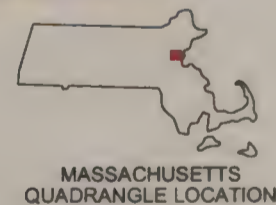
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).

0 150 300
SCALE, FEET

50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-3

DISPOSAL SITE MAP
AND
SITE BOUNDARY

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Theresa E Fish and Mr. Alex Vilcapoma
22 Franklin Avenue
Somerville, MA 02143

Dear Ms. Theresa E Fish and Mr. Alex Vilcapoma,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone". The signature is fluid and cursive, with a large loop at the end.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Theresa E Fish and Jharana Pradhan
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 22 Franklin Avenue
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

**Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts**

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

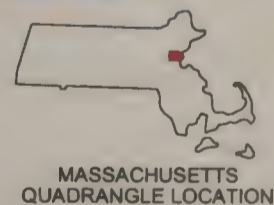
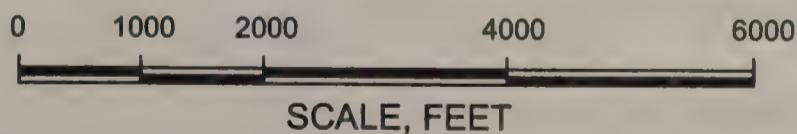
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts
UniFirst Corporation
Wilmington, Massachusetts



SITE LOCATION MAP

Project 04516-2

July 2008

Fig. ES-1

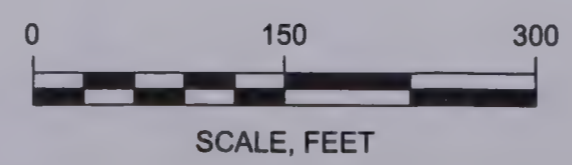


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street Somerville, Massachusetts			DISPOSAL SITE MAP AND SITE BOUNDARY	
UniFirst Corporation Wilmington, Massachusetts			Project 04516-3	May 2009
				Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Balvir Singh and Jharana Pradhan
21 Franklin Avenue
Somerville, MA 02143

Dear Balvir Singh and Jharana Pradhan,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Balvir Singh and Jharana Pradhan
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 19-21-23 Franklin Ave (& Franklin Ave property Map 104/Block D/Lot 7)
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

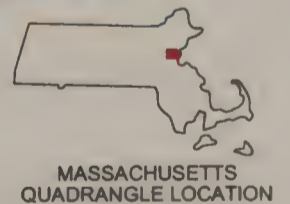
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

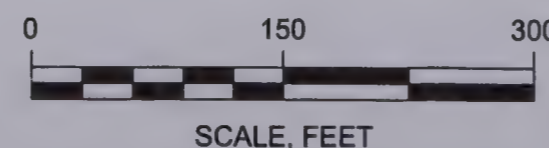


LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- 138 ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- $\mu\text{g/l}$ = MICROGRAMS PER LITER

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
5. THE 50 $\mu\text{g/l}$ BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



DISPOSAL SITE MAP
AND
SITE BOUNDARY

Project 04516-3

May 2009

Fig. ES-2

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Amrit P. Thakali
13 Franklin Avenue
Somerville, MA 02143

Dear Amrit P. Thakali,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amrit P. Thakali
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 13 & 15 Franklin Avenue (& Washington Ave property Map 104/Block D/Lot 69)
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :

(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil
☒ 2. Groundwater see attached
☐ 3. Surface Water
☐ 4. Sediment
☐ 5. Indoor Air
☐ 6. Other: (specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane,1,1-

Dichloroethylene,1,1-

Tetrachloroethylene (PCE)

Trichloroethane,1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

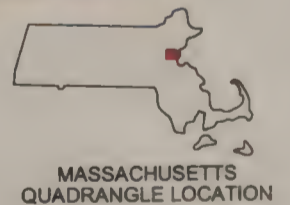
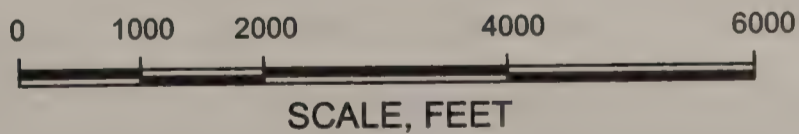
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Maria Soures
9 Franklin Avenue
Somerville, MA 02143

Dear Ms. Maria Soures,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Maria Soures
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
a. Street Address: 9 Franklin Avenue (& Washington Ave property Map 104/Block D/Lot 68)
b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :

(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil _____
☒ 2. Groundwater see attached
☐ 3. Surface Water _____
☐ 4. Sediment _____
☐ 5. Indoor Air _____
☐ 6. Other: _____
(specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation

68 Jonspin Road

Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.

400 Unicorn Park Drive

Woburn, MA 01801

781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

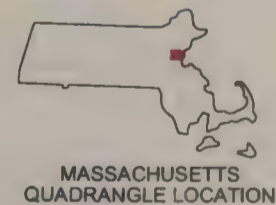
GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



0 1000 2000 4000 6000
SCALE, FEET



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

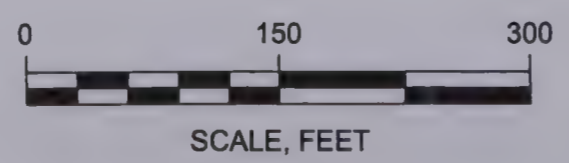
July 2008

Fig. ES-1



- LEGEND:**
- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
 - MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
 - MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
 - SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
 - MONITORING WELL INSTALLED BY GEI, MAY 2006
 - DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
 - MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
 - PREVIOUSLY INSTALLED IRRIGATION WELL
 - CHAIN LINK FENCE
 - ROOM NUMBER AT CAPUANO SCHOOL
 - BOUNDARY OF COMMUNITY GARDENS
 - STREET ADDRESS
 - MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
 - DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
 - µg/l = MICROGRAMS PER LITER

- GENERAL NOTES:**
- HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
 - STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
 - MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
 - GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
 - THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



50 Tufts Street Somerville, Massachusetts		DISPOSAL SITE MAP AND SITE BOUNDARY	
UniFirst Corporation Wilmington, Massachusetts		Project 04516-3	May 2009
		Fig. ES-2	

May 20, 2009
Project 04516-3



Geotechnical
Environmental
Water Resources
Ecological

Ms. Nicole Callahan
40 Edwards Street
Medford, MA 02155

Dear Ms. Nicole Callahan,

**Re: Informational Notice to Property Owners
50 Tufts Street
Somerville, Massachusetts
Department of Environmental Protection Release Tracking Number 3-23246**

On behalf of UniFirst Corporation of Wilmington, Massachusetts, and in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.1406), GEI Consultants, Inc. is providing you with the attached "Informational Notice to Property Owners" (Form BWSC-122) for the 50 Tufts Street Site in Somerville, Massachusetts (the Site).

GEI submitted a Phase II Comprehensive Site Assessment, Method 3 Risk Characterization, and Phase III Remedial Action Plan (the Report) for the Site to the Massachusetts Department of Environmental Protection (DEP) on July 14, 2008. In response to comments provided by DEP, GEI revised the approximate site boundary to reflect the estimated extent of very low concentrations of chlorinated Volatile Organic Compounds (VOCs) beyond the original site boundary deep underground in the bedrock. The Phase II Report demonstrated that although there are chlorinated VOCs present in bedrock at very low concentrations, there is not a completed exposure pathway between these chlorinated VOCs and any receptor. A copy of the Executive Summary from the original Report, together with a map showing the boundaries of the Site as revised and submitted to DEP in May 2009, are attached.

Individuals and public officials may request additional public involvement activities under 310 CMR 40.1400.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Ileen S. Gladstone", written over a horizontal line.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

ISG:adl

c: John Badey, UniFirst Corporation
Vithal Deshpande, City of Somerville
Irene Dale, Massachusetts Department of Environmental Protection



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - **23246**

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 50 Tufts Street
2. City/Town: Somerville, MA 3. ZIP Code: 02145-4129

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Somerville 75 Washington Street LLC
2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:
- a. Street Address: 75 Washington Street
- b. City/Town: Somerville, MA c. ZIP Code: 02145-0000

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☒ 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- ☐ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
- ☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY :
(check all that apply)

AFFECTED ENVIRONMENTAL MEDIA

PRINCIPAL CHEMICAL(S) PRESENT

- ☐ 1. Soil _____
- ☒ 2. Groundwater see attached
- ☐ 3. Surface Water _____
- ☐ 4. Sediment _____
- ☐ 5. Indoor Air _____
- ☐ 6. Other: _____
(specify)

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☒ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
- ☒ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1. Contact Name: Ileen Gladstone, GEI Consultants, Inc 2. Street: 400 Unicorn Park Drive
3. City/Town: Woburn 4. State: MA 5. ZIP Code: 01801-3341
6. Telephone: (781) 721-4012 7. Email: igladstone@geiconsultants.com



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

INFORMATIONAL NOTICE TO PROPERTY OWNERS

3 - 23246

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report (**Section E**). These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at <http://www.mass.gov/dep/cleanup/oview.htm>.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See <http://mass.gov/dep/about/region/schedule.htm> if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Compounds of Potential Concern
Monitoring Well MW121D
50 Tufts Street
Somerville, Massachusetts

Volatile Organic Compounds (VOCs)

cis-1,2-Dichloroethylene

Dichloroethane, 1,1-

Dichloroethylene, 1,1-

Tetrachloroethylene (PCE)

Trichloroethane, 1,1,1- (TCA)

Trichloroethylene (TCE)

RTN 3-23246

**Phase II Comprehensive Site
Assessment, Method 3 Risk
Characterization, and Phase III
Remedial Action Plan**

50 Tufts Street, Somerville, Massachusetts

Submitted to:

UniFirst Corporation
68 Jonspin Road
Wilmington, MA 01887

Prepared by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

July 14, 2008

Project No. 04516-2

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

Executive Summary

On behalf of UniFirst Corporation (UniFirst) of Wilmington, Massachusetts, GEI Consultants, Inc. (GEI) prepared this Phase II Comprehensive Site Assessment (CSA) and Phase III Remedial Action Plan (RAP) for the Site located at 50 Tufts Street in Somerville, Massachusetts (the Site; Fig. ES-1). This report also includes a Method 3 Risk Characterization for the Site, prepared by AMEC Earth & Environmental (AMEC) of Westford, Massachusetts. Based on the results of assessments conducted to date, the Site includes the 50 Tufts Street property (the Property), together with portions of residential and commercial properties to the east and immediately north, south and west of the Property, and the Michael E. Capuano Early Childhood Center (Capuano Center) located at 150 Glen Street in Somerville, Massachusetts (Fig. ES-2).

In 2002, a historical release of chlorinated volatile organic compounds (VOCs) to soil and groundwater at the Property was reported to the Massachusetts Department of Environmental Protection (DEP) and assigned Release Tracking Number (RTN) 3-23246. Subsequent investigations at the Property from 2002 until 2005 identified historical releases of chlorinated VOCs to indoor air at the Property, and to groundwater and indoor air at residential properties adjacent to the Property across Tufts Street. DEP issued a Notice of Responsibility (NOR), dated November 9, 2005, to UniFirst and identified UniFirst as a potentially responsible party (PRP). The Site is classified Tier IC.

Site History

From approximately 1955 to approximately 2002, the Property was used for storage and distribution of industrial chemicals, laundry supplies, and dry cleaning supplies. Chemicals stored at and delivered to and from the Property included chlorinated solvents. These chlorinated VOCs – particularly tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA) – have been detected in soil, soil vapor, indoor air, and groundwater on the Property and are therefore the compounds of potential concern (COPCs) for the Site.

Subsurface Investigation

Since March 2006, GEI has conducted subsurface investigations as a combination of Immediate Response Action (IRA) and Phase II activities, including:

- Installing five bedrock groundwater monitoring wells, three deep overburden monitoring wells, and 25 shallow overburden monitoring wells.
- Measuring groundwater levels monthly.

- Conducting hydraulic conductivity testing at selected monitoring wells.
- Conducting a geophysical bedrock survey of portions of the Site.
- Collecting quarterly subsurface soil vapor and groundwater samples for laboratory analysis.
- Collecting soil samples for laboratory analysis.
- Evaluating subsurface utilities.

Contaminant Distribution

The geology at the Site is composed of three units: shallow overburden (fill, silt, and till), deep overburden (till), and bedrock (argillite). The general direction of groundwater flow from the Property is to the southeast across Tufts Street towards Knowlton Street and Franklin Street.

Dissolved-phase chlorinated VOCs have been detected in groundwater in shallow and deep overburden, and bedrock beneath the Property and to the south and east of the Property. The central portion of the overburden groundwater plume is characterized by the presence of high concentrations of dissolved chlorinated VOCs, particularly PCE. The co-mingled PCE, TCE, and TCA plumes generally extend to the east and southeast of the Property, consistent with prevailing groundwater flow directions.

The shallow overburden groundwater plume is bounded approximately by Alston Street, Cross Street, Glen Street, Oliver Street, and Franklin Avenue. The Site boundary is shown in Fig. ES-2. The deep overburden and bedrock groundwater plumes extend beyond the eastern boundary of the shallow overburden plume at a very low concentration, based on the concentrations of PCE detected in groundwater collected from wells in till and bedrock.

Chlorinated VOCs generally have not been detected in soils beyond the boundaries of the Property. They have been detected in soil vapor beneath and in areas surrounding the Property, primarily in areas overlying the shallow overburden groundwater plume. Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at the Property, at some residences and commercial buildings in the vicinity of the Property, and at the Capuano Center. Whether and to what extent a completed pathway may exist has proven to be highly site-specific depending on, among other things, location, soil type, foundation characteristics, and building design and condition.

Although no dense nonaqueous phase liquid (DNAPL) has been observed in monitoring wells or soils at the Site, based on multiple lines of evidence it is likely present in the overburden down to the top of bedrock (and possibly in bedrock) at the Site. The majority of DNAPL exists as

residual DNAPL, which is immobile. Any connected phase DNAPL that may be present at the Site has reached a steady state and is not migrating.

Source Mitigation

According to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a source of oil or hazardous material (OHM) which *is resulting or is likely to result in an increase in concentrations* of OHM in an environmental medium either by direct discharge or by intermedia transfer (310 CMR 40.1003(5)) must be eliminated or controlled in order to achieve a Permanent Solution and a Class A or B Response Action Outcome (RAO). To achieve a Temporary Solution and a Class C RAO, such an uncontrolled source must be eliminated, controlled, or mitigated to the extent feasible. By contrast, if the dissolved phase groundwater plume has reached a steady state and any DNAPLs are not migrating, as is the case here, then there is no source that is resulting in or is likely to result in an increase in concentrations of OHM in an environmental medium, and the source control criteria do not apply.

More specifically, at this Site:

- The residual DNAPL (and any connected phase DNAPL) is not migrating and exists in a stable configuration because of capillary trapping forces. The stability of the DNAPL sources is consistent with the stable groundwater concentrations in monitoring wells within the area of likely DNAPL occurrence.
- The dissolved phase groundwater plumes are at steady-state across the network of monitoring wells in both the overburden and bedrock.
- The DNAPL sources and the dissolved phase groundwater plumes are stable and are not causing an increase in concentrations of VOCs in groundwater, soil, soil vapor, or indoor air.

Mitigation of Vapor Intrusion Pathway

Sub-slab soil vapor testing and/or indoor air testing has identified complete vapor intrusion pathways at some residential and commercial buildings within the Site, and at the Capuano Center. Complete vapor intrusion pathways in the residences and the Capuano Center are considered Critical Exposure Pathways (CEP) and are presumed to require prevention, elimination, and/or mitigation to the extent feasible. GEI conducted, or is conducting, IRAs to mitigate these pathways.

To mitigate the vapor intrusion pathway in the building at the Property, GEI installed a sub-slab depressurization system (SSDS) which began operating in April 2007. Based on indoor air testing results collected since the SSDS has been operating, a condition of no Imminent Hazard

and a condition of No Significant Risk (NSR) for full-time commercial workers has been achieved for the Property building. The building at the Property is currently occupied by John's Auto Sales, a used car dealership. GEI also installed a soil vapor extraction system (SVE) at the Property to remove chlorinated VOCs from the soil above the groundwater table. The SVE system began operating in August 2007. To date, approximately 3,700 pounds (lbs) of VOCs have been removed by the SVE system.

To mitigate the vapor intrusion pathway in residences and commercial buildings, GEI is installing Exposure Pathway Elimination Measures (EPEMs). GEI conducted an evaluation of 70 residential and commercial properties at the Site. As of May 9, 2008, GEI has recommended installing EPEMs at 29 buildings: three based on sub-slab soil vapor testing results, and 26 based on indoor air testing results. To date, seven EPEMs have been installed. EPEMs have taken the form of either an SSDS or a vapor barrier and venting system, tailored to the individual characteristics of each building.

To mitigate the vapor intrusion pathway at the Capuano Center, GEI installed an SSDS, which began operating in February 2007. Since the SSDS has been operating, a condition of NSR for Capuano Center workers and students has been achieved, and the CEP has been eliminated.

Method 3 Risk Characterization

A site-specific Method 3 Risk Characterization was performed to evaluate the potential harm to human health and the environment. However, risk calculations were not performed for inhalation risks at residences or the Capuano Center because the detection of chlorinated VOCs associated with the Site in the occupied living space of a residence or the Capuano Center is a CEP requiring mitigation to the extent feasible.

The potential exposure pathways evaluated at the Site include:

- Ingestion and dermal contact with soil by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper; and a future utility worker and construction worker.
- Ingestion and dermal contact with groundwater by a future utility worker.
- Inhalation of air in an excavation by a future utility worker and construction worker.
- Inhalation of indoor air by current and potential future occupants of commercial buildings.
- Inhalation of outdoor air by a current and future commercial worker, resident, trespasser, visitor, student, teacher, railroad worker, and landscaper.

The results of the Method 3 Risk Characterization demonstrate that potential risk from the Site to current and future receptors is at a level of NSR, assuming the indoor air exposure pathway is mitigated, where necessary to address CEPs.

Phase III Remedial Action Plan

In the Method 3 Risk Characterization, it was assumed that systems installed and proposed for installation at the Site as IRAs to mitigate indoor air exposure pathways would be implemented. A condition of NSR was demonstrated for all other potential exposure scenarios. The SSDSs and other EPEMs installed to address the indoor air exposure pathway have been shown to be effective. However, in accordance with the requirements of the MCP, GEI identified and evaluated the complete range of potential remedial technologies and remedial action alternatives that could achieve the remedial goals for the Site notwithstanding the demonstrated success of the EPEMs currently being installed. Based on this approach, and the results and assumptions documented in the Method 3 Risk Characterization, the following remedial action objectives were identified:

- Eliminate to the extent feasible potential inhalation exposure of current and future residents to chlorinated VOCs in indoor air off the Property and future residents on the Property.
- Eliminate to the extent feasible potential inhalation exposure of current and future occupants of the Capuano Center to chlorinated VOCs in indoor air.
- Where necessary, control potential inhalation exposure of the current and future commercial workers to chlorinated VOCs in indoor air off the Property and on the Property.

Following an initial screening of potential remedial technologies, GEI identified five Remedial Action Alternatives (RAAs) to address the remedial goals for the Site:

- RAA1 – Site-wide EPEMs and Monitored Natural Attenuation (MNA)
- RAA2 – SVE at the Property, Site-wide EPEMs, and MNA
- RAA3 – Dual-Phase Extraction (DPE) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA4 – Chemical Oxidation (Chem-Ox) at and Immediately East of the Property, MNA, and Downgradient EPEMs
- RAA5 – Hydraulic Control, MNA, and Site-wide EPEMs

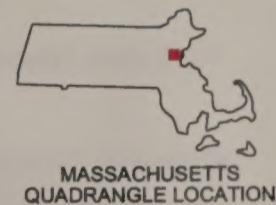
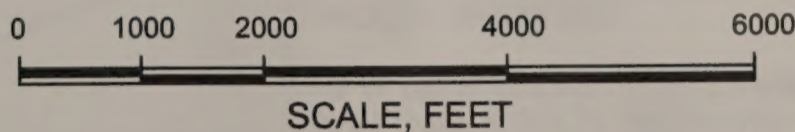
GEI conducted a detailed evaluation of these five alternatives using the eight criteria specified in the MCP with consideration given to the site-specific conditions that will influence the feasibility of implementing remedial technologies. All of the RAAs rely on EPEMs to achieve NSR by mitigating the vapor intrusion pathway into the indoor air of residences and commercial buildings. The MCP does not specify a time-frame for reaching a Permanent Solution; therefore each of the RAAs has the potential to achieve a Permanent Solution. The installation of EPEMs to mitigate the vapor intrusion pathway achieves NSR, and MNA will ultimately achieve a Permanent Solution at the Site. Once EPEMs are installed in all buildings where appropriate, the Site will operate in Remedy Operation Status (ROS).

GEI recommended RAA2 for the Site because it is timely and cost-effective, it ranked favorably compared to the other feasible alternatives based on the eight criteria specified by the MCP, and, due to the operation of the SVE system, it results in a reduction in the overall mass of contaminants at the Site, meeting the requirements of the Response Action Performance Standards (RAPS).

GEI concluded that it was not feasible to achieve background conditions at the Site because none of the RAAs could reasonably eliminate dissolved phase contaminants in bedrock groundwater or potential residual DNAPL in bedrock fractures. RAA5 – Hydraulic Control could likely be designed to capture VOC-affected bedrock groundwater, but at a substantial cost and with no reduction in risk at the Site. Therefore, GEI concluded that the cost to achieve background was disproportionate to the benefits that might accrue from such extensive remedial actions, and therefore achieving background is not feasible.

Conclusions and Recommendations

GEI recommends that EPEMs continue to be maintained where already installed at the Property, residences, commercial buildings, and the Capuano Center. Additional measures should be considered, where feasible, to convert active SSDSs to passive barrier and ventilation systems. The SVE system should continue operation in its current configuration until monitoring data indicate that residual source material in the vadose zone has been substantially removed. Confirmatory sampling that remains to be conducted under the established monitoring plan should be completed, and EPEMs should be installed at properties within the Site as and when required. Groundwater monitoring also should continue to further substantiate that the chlorinated VOCs plume (PCE, TCE, and TCA) is at steady state.



This Image provided by MassGIS is taken from
U.S.G.S. Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD1929).
Contour Interval is 3 Meters.

Phase II CSA and Phase III RAP
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts



Project 04516-2

SITE LOCATION MAP

July 2008

Fig. ES-1

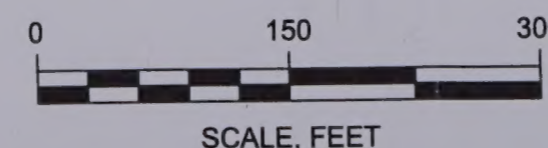



LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- CHAIN LINK FENCE
- ROOM NUMBER AT CAPUANO SCHOOL
- BOUNDARY OF COMMUNITY GARDENS
- STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- µg/l = MICROGRAMS PER LITER

GENERAL NOTES:

- HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
- STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
- MONITORING WELL LOCATIONS AND ELEVATIONS, AND CAPUANO CENTER COMMUNITY GARDEN LOCATIONS WERE ESTABLISHED BY ON THE GROUND SURVEYS BY BSC GROUP, INC.
- GEI OBSERVED DECOMMISSIONING OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.
- THE 50 µg/l BOUNDARY LINE IS BASED ON GROUNDWATER ANALYTICAL RESULTS PRESENTED IN THE PHASE II COMPREHENSIVE SITE ASSESSMENT (JULY 16, 2008).



<p>50 Tufts Street Somerville, Massachusetts</p>		<p>DISPOSAL SITE MAP AND SITE BOUNDARY</p>
<p>UniFirst Corporation Wilmington, Massachusetts</p>	<p>Project 04516-3</p>	<p>May 2009 Fig. ES-2</p>

